REMARKS

After entry of this response, claims 39-52 remain pending in the present application. No new claims have been added to the application.

Rejections under 35 U.S.C. § 103(a)

Hyllberg and Boguslavsky do not make obvious claims 39 and 40.

The Examiner has rejected claims 39 and 40 as being unpatentable over U.S. 5,707,326 to Hyllberg ("Hyllberg") in view of U.S. 4,957,058 to Boguslavsky ("Boguslavsky"). Applicant respectfully disagrees with this conclusion because there is not motivation present in the art to combine the Hyllberg and Boguslavsky references and, even if there were, the combination of these references fails to make obvious all of the limitations of the claims.

Hyllberg teaches applying a ceramic layer as part of a coating for a roller core used in xerographic reproduction machines. The ceramic layer may be applied using plasma spraying techniques or equipment. While the roller is still hot from the plasma or thermal spraying of the ceramic layer, a seal coat is applied to the ceramic layer using a dielectric organic material such as Carnauba wax or Loctite 290 weld sealant. (Hyllberg, col. 6, ll. 50-54). Many alternative sealants are discussed including various types of waxes, silicone elastomers, epoxies, methacrylates, other thermoset resins, silicone oils, and others. (Hyllberg, col. 6, l. 59- col. 7, l. 13).

The process may optionally include the application of a Teflon® (PTFE) coating to the roller to provide properties such as a reduced coefficient of friction or improved release of toner. (Hyllberg, col. 7, ll. 14-20). Because of concerns about the effect of such a Teflon coating on the electrical properties of the coated roller, the application notes that the "effect on the roller would be minimized if the PTFE were very thin or *if peaks of the ceramic protruded through it.*" (Hyllberg, col. 7, ll. 20-22). (emphasis added).

A final required step in the Hyllberg process is to grind and polish the sealed ceramic layer and surface finish it using diamond or silicon carbide abrasives or the like. (Hyllberg, col. 7, ll. 23-26). The Hyllberg reference is not a fully enabled reference without including all of the required steps of the process, and it is improper to combine elements of this reference with another reference without including all of the enabling steps.

The Boguslavsky reference discloses a machine for applying gas-thermal coatings to workpieces of various shapes by clamping the workpiece into a chuck and rotating it at a continuous rate while reciprocating a spray gun along an upper generating line of the workpiece. (Boguslavsky, col. 4, l. 61 to col. 5, l. 55; col. 6, l. 33 to col. 7, l. 13). Boguslavsky provides a means for stopping coating material from being fed to the coating gun during unexpected and unplanned stops of the rotation drive, but does not vary the rate of movement of the target or intentionally vary the point where the target or gun starts or stops in order to reduce the likelihood of peaks or valley in the coating. (Boguslavsky, col. 5, l. 25-35).

Applicant respectfully disagrees with the conclusion that Applicant's claims 39 and 40 are obvious over the cited art. The cited references, alone or in combination, fail to teach or suggest all of the elements these claims. Applicant's claims are not attempting to cover any coating process that applies a coating to a cylindrical target. Applicant's claims are directed toward and limited to a method including the steps of mounting a cylindrical target to a target assembly, moving the target, and plasma spraying particles of coating material on the cylindrical target until a uniform coating of desired thickness is achieved. The cited art neither discloses or suggests such a process.

The Hyllberg process includes plasma coating of a generally cylindrical target. However, it is clear from the additional required steps of machining and polishing the coating that the Hyllberg process can not fairly be described as a process including the step of plasma spraying particles of coating material on a cylindrical target until a uniform coating is achieved as required by claim 39. Further, the Hyllberg coating is specifically described as having peaks that

may protrude through an optional Teflon coating. (Hyllberg, col. 7, ll. 20-22). These peaks are described as having beneficial characteristics regarding the ultimate use of the coated product in a xerographic reproduction machine. Id. Boguslavsky similarly does not disclose at least the steps of the claimed invention just described. The cited references therefore do not disclose all of the required elements of the process claim 39.

In order to satisfy the burden of establishing a case of obviousness the Examiner must show an objective teaching in the prior art—or knowledge generally available to one of ordinary skill the art—that would lead that individual to combine the relevant teachings of the references. In re Fritch, 972 F. 2d 1260, 1265 (Fed. Cir. 1992). Combining prior art references without evidence of a suggestion, teaching, or motivation to combine simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability. In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999); Interconnect Planning Corp. v Feil, 774 F.2d 1132, 1138 (Fed. Cir. 1985). The best defense against the subtle but powerful attraction of a hindsight based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999). There is no basis for concluding that an invention would have been obvious solely because it is a combination of elements that were known in the art at the time of the invention. Fromson v Advance Offset Plate, Inc., 755 F.2d 1549, 1556 (Fed. Cir. 1985). The showing of a motivation to combine must be clear and particular, and it must be supported by actual evidence. In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999); *C.R. Bard*, 157 F.3d 1340, 1352 (Fed. Cir. 1993).

It is unclear why one of ordinary skill in the art contemplating the Hyllberg reference would have even consulted Boguslavsky, let alone have been motivated to combine the references. Hyllberg, which was filed by one supposedly skilled in the art after Boguslavsky issued, provides no teaching that would have suggested the desirability of modifying the coating process of Hyllberg to include the use of a target holder and application device system of

Boguslavsky. Boguslavsky contains no teaching or suggestion that the target holder elements would be beneficial to a coating method as taught by Hyllberg. Further, the Examiner has not identified any such motivation in the teachings or in the art.

The Hyllberg process includes several processing steps that are performed on the coated target after the plasma coating has been applied. These processing steps obviate any motivation for modifying the plasma coating process of Hyllberg to include the use of a target holder and application device system of Boguslavsky. The processing step of grinding and polishing the sealed ceramic coating reinforces the conclusion that the uniformity of the plasma coating as initially applied is not a focus or objective of the process used in the Hyllberg reference. In fact, when a Teflon coating is used the Hyllberg reference discussed potential benefits of peaks that are apparently inherent in the plasma-applied ceramic coating of the Hyllberg reference. (Hyllberg, col. 7, ll 20-22). Hyllberg neither recognizes nor suggests the desirability of using a target holder and application device as in Boguslavsky, nor does it suggest looking to other unrelated coating processes for ideas to improve upon or modify the coating process of Hyllberg. The Hyllberg reference contains disclosure of a plasma coating process that is one step of an elaborate process for creating a roller for use in a xerographic reproduction machine, a coating process that includes producing a ceramic layer described as having potentially beneficial peaks as applied. Hyllberg does not contain any objective teaching that would lead one to modify this coating process to include the system of Boguslavsky, let alone a clear and particular motivation to do so.

Even if there were a motivation present in the art to combine these references, such a combination does not result in Applicant's invention. The Hyllberg disclosure is of a five-step process to produce a charger roller for use in a xerographic copying machine. The disclosure is not a fully functional primary reference without including the steps of 1) grit blasting the surface of the target, 2) applying a bonding layer (optionally by plasma coating), 3) plasma coating the target, 4) applying a sealant over the coating, and 5) grinding and polishing the coating. Adding

the target holder and application device of Boguslavsky to the fully functional disclosure of Hyllberg does not result in anything resembling Applicant's claimed invention. The combination of these references, when considered in their entirety, does not make obvious a process including the steps of mounting a cylindrical target to a target assembly, moving the target, and plasma spraying particles of coating material on a cylindrical target until a uniform coating is achieved as required by claim 39. The combination of discrete elements of these references without regard to the existence of a motivation to combine the references, or whether such a combination results in the invention described in claim 39, is an impermissible use of Applicant's disclosure as a blueprint for piecing together the prior art to attempt to defeat patentability.

Claim 40 requires the additional step of starting and stopping the motion of the cylindrical target at varying points. Boguslavsky describes a mechanism for moving the spray gun to a non-working position in response to unexpected stops of the rotation drive. (Boguslavsky, col. 5, ll. 28-36). This can not fairly be described as a step of starting and stopping the motion of the target at varying points. The Boguslavsky description discloses only a fail-safe mechanism for unexpected stops of the rotation drive, not the process step required by claim 40. Applicant respectfully requests that the rejection of claims 39 and 40 over Hyllberg in light of Boguslavsky be withdrawn.

Hyllberg, Boguslavsky, and Lauterbach do not make obvious claims 41, 44, 45, or 47-51.

The Examiner has rejected claims 41, 44, 45, and 47-51 as being unpatentable over Hyllberg and Boguslavsky as applied to claims 39 and 40, and further in view of U.S. 3,900,639 to Lauterbach ("Lauterbach").

Applicant incorporates the above discussion of the deficiencies of the Hyllberg and Boguslavsky references as regards the Office Action's application of those references to claims 39 and 40. Applicant believes that claim 41 is allowable as being dependent from, and including

all of the limitations of, allowable claim 39. Applicant also believes that independent claim 44 is allowable for reasons similar to those given in support of the allowabilty of claim 39, and that claims 45 and 47-51 are allowable as being dependent from, and including all of the limitations of, independent claim 44. Applicant also believes that the combination of Hyllberg and Boguslavsky with Lauterbach is improper due to a lack of motivation to combine the references and that in any event these references fail to teach all of the limitations of claims 41, 44, 45, or 47-51. Lauterbach's disclosure of a system for the removal of decomposition products does not make obvious the step of directing gas flow across plasma streams between plasma spray devices and a cylindrical target to divert smaller plasma-sprayed particles and other small particles.

According to Lauterbach, decomposition products that may look like smoke may be formed in some plasma spray coating processes. (Lauterbach, col 2, ll. 20-40). The area of the workpiece to be coated may subsequently become polluted with these decomposition products. Id. Lauterbach teaches to direct a gas flow across a plasma stream to cause decomposition products in the plasma stream to be deflected and removed from the plasma stream. (Lauterbach, col 1, l. 48 to col. 2, l. 40; col. 3, ll. 14-20).

Even if Hyllberg and Boguslavsky made obvious claim 39 and the elements of claim 44 not associated with directing gas flow across the plasma streams between the plasma spray devices and the cylindrical target to divert smaller plasma-sprayed particles and other small particles beyond the cylindrical target, the addition of Lauterbach is improper and does not make obvious claims 41, 44, 45, or 47-51.

Hyllberg and Boguslavsky do not contain any motivation to look to Lauterbach or to combine its teachings with Hyllberg and Boguslavsky. Neither Hyllberg nor Boguslavsky provide any teaching that would have suggested the desirability of modifying the coating process to include the use of a transverse gas stream to remove decomposition products as in Lauterbach. Neither reference contains any recognition of deleterious effects of decomposition products or other light particles on the quality of the coating. Neither reference even mentions the possibility

of decomposition products being entrained in the plasma spray. Lauterbach is concerned with suppressing the formation and embedding of oxides in the material flow or jet from the plasma spray gun. (Lauterbach col. 5, ll. 22-36). These concerns are not mentioned in either Hyllberg or Boguslavsky. The use of the alleged general desire to form a uniform coating as a motivation to combine references, if taken to its logical limits, would allow for the combination of any primary reference with any reference having anything to do with any kind of coating technology. Patent law prevents this extreme result by requiring the rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. In re Dembiczak, 175 F.3d 994, 999 (Fed. Cir. 1999). The primary references do not contain any objective teaching that would lead one to modify their combined teachings to include the transverse gas flow of Lauterbach, let alone a clear and particular motivation to do so. Combining three references to invalidate Applicant's claims without any explicit motivation in the art to do so is impermissible "picking and choosing" from the prior art based on Applicant's disclosure to defeat patentability.

Even if a motivation to combine were present, Hyllberg in view of Boguslavsky and in further view of Lauterbach do not make obvious claims 41, 44, 45, or 47-51. As detailed above, the combination of Hyllberg and Bogulavsky does not include plasma spraying particles of coating material on the cylindrical target until a uniform coating of predetermined thickness is attained as is required by independent claims 39 and 44. The Hyllberg reference discloses a plasma coating step as a part of a production process that include grinding and polishing a coating that may include peaks. In fact the Hyllberg reference discloses advantages associated with peaks in the coating and does not disclose a uniform coating until after additional processing, if at all.

The application of Hyllberg and Bogulavsky to claim 45 has similar infirmities as the rejection of claim 40 over Hyllberg and Bogulavsky as discussed above. That is, while claim 45 requires the additional step of starting and stopping the motion of the cylindrical target at varying

points, Boguslavsky only describes a mechanism for moving the spray gun to a non-working position unexpected stops of the rotation. (Boguslavsky, col. 5, ll. 28-36). This can not fairly be described as a step of starting and stopping the motion of the target at varying points.

In addition to the reasons discussed above, adding the Lauterbach reference to the combination of Hyllberg and Boguslavsky does not make obvious claim 47 and 48 due to the following additional deficiencies in the cited art. Lauterbach is concerned with the suppressing the formation and embedding of decomposition products in the material flow or jet from the plasma spray gun. (Lauterbach col. 5, ll. 22-36). The Lauterbach reference mentions control parameters usable to adjust the transverse gas flow to *completely* remove the decomposition products, without any recognition of or regard to size as a parameter, if the width of the plasma jet is limited and the user accepts a reduction in the degree of deposition of the desirable elements of the plasma stream. (Lauterbach, col. 6, ll. 5-20). Lauterbach contains no disclosure relating to using a transverse gas flow to remove coating particles that have not decomposed based on a size classification, nor does it include a recognition of a desirability to do so.

Lauterbach does not disclose or make obvious the requirements of claim 47 the gas flow be maintained at a rate that will divert particles smaller than a predetermined size beyond the deposition zone, while allowing larger particles to deposit on the cylindrical target within the deposition zone. Lauterbach also does not make obvious the additional requirement of claim 48 that this predetermined size is less than 10 micrometers. Embodiments of Applicant's invention are directed toward coating a cylindrical target for use in magnetron sputter coating. Sputter coating targets are bombarded with ions to dislodge the target material so that it can coat a nearby substrate, preferably on an atom-by-atom basis. If particles smaller than a predetermined size are deposited on the target, they may be dislodged in their entirety by the ion bombardment, causing defects in the sputter coated products. While Applicant's claims are not limited to this application, applicant's recognition of this issue and resolution of the problem by using a transverse gas flow to divert particles based on their size is not anticipated or made obvious by

Lauterbach's disclosure of a transverse gas flow that removes decomposition products from a plasma stream. Applicant respectfully requests that the rejection of claims 47 and 48 be withdrawn.

Claims 49-51 are allowable because they depend, either directly or indirectly, from allowable independent claim 44 and include all of the limitations of that claim and any interceding claim.

Hyllberg, Boguslavsky, Lauterbach, and Borom do not make obvious claims 43, 46, or 52.

The Examiner has rejected claims 43, 46, and 52 as being unpatentable over U.S. Hyllberg, Boguslavsky, and Lauterbach as applied to claims 41, 44, 45, and 47-51, and further in view of U.S. 5,897,921 to Borom et al. ("Borom"). Applicants respectfully believe that the combination of references is improper, and even if proper, does not make obvious the process step of directing a gas flow or systematic blast of gas onto a surface proximate to the deposition zone to preclean the deposition zone. Borom discloses a preheater that does not make obvious Applicant's claimed invention, inherently or otherwise.

The Examiner notes that Borom teaches a method of spray coating a rotating substrate including directing a preheating device such as a air plasma or other gas torch to the area to be coated to raise the temperature so that localized melting will take place upon coating. It is the Examiner's position that this would inherently provide precleaning of the area to be coated as well, due to the temperature of the plasma torch and the temperature needed to raise the area to the melting point. Borom teaches a preheater that passes over the material to be coated to increase the temperature of a surface ribbon so the additional heat provided by the plasma torch effects localized melting of the surface ribbon. (Borom, col. 4, ll. 33-54). As each ribbon is formed by this process of localized melting, they overlap and form a multilayer coating of welded together sublayers. Id.

Applicant incorporates the above discussion of the deficiencies of the Hyllberg, Boguslavsky, and Lauterbach references as regards the application of those references to claims 41, 44, 45, and 47-51. Applicant believes that claim 43 is allowable as being dependent from, and including all of the limitations of, allowable claims 41 and 39. Applicant also believes that claim 46 is allowable as being dependent from, and including all of the limitations of, allowable claim 44, and that claim 52 is allowable for at least reasons similar to those given in support of the withdrawal of the rejection of claim 39 above.

Even if Hyllberg, Boguslavsky, and Lauterbach were deemed to make obvious claims 39 and 41 and the elements of claims 44 and 52 not associated with directing a gas flow or systematic blast of gas onto a surface location of the cylindrical target proximate to the deposition zone before entering the plasma streams to preclean the deposition zone, the addition of Borom is improper and does not make obvious claims 43, 46, or 52.

Hyllberg, Boguslavsky, and Lauterbach do not contain any motivation to look to Borom or to combine its teachings with Hyllberg, Boguslavsky, and Lauterbach. None of these references provide any teaching that would have suggested the desirability of modifying a coating process to include the use of a preheater that provides localized melting of the surface to be coated as in Borom. None of these references contain any recognition of a benefit to melting the surface to be coated and creating a series of welded together sublayers. Borom is concerned with remelting the surface ribbon at the spray site for sequentially melting the sequentially deposited surface ribbons to the sublayer ribbons. (Borom Abstract). The Examiner's assertion that it would have been obvious to use a preheater that melts previous layers of coating to provide a better bonding of the applied coating and to preclean finds no support in the cited references. The primary references do not contain any objective teaching that would lead one to modify their combined teachings to include the preheater of Borom, let alone a clear and particular motivation to do so. The sheer number of references that were combined to invalidate Applicant's claims without any explicit motivation in the art to do so is also evidence of the

nonobvious nature of the claims. Applicant respectfully request that these rejections be withdrawn as there is no motivation in the art to combine these references.

Even if there were a motivation to combine, the combination of Hyllberg, Boguslavsky, and Lauterbach with Borom would not make obvious claims 43, 46, and 52. Borom describes the process as a preheater that passes over the material to be coated to increase the temperature of a surface ribbon so the additional heat provided by the plasma torch effects localized melting of the surface ribbon. (Borom, col. 4, ll. 33-54). As each ribbon is formed by this process of localized melting, they overlap and form a multilayer coating of welded together sublayers. Id. Exemplary preheaters are described as an air plasma torch or other gas torch. (Borom, col. 4, ll. 60-63). A process step of directing a gas flow or systematic blast of gas onto a surface location of the cylindrical target proximate to the deposition zone before entering the plasma streams to preclean the deposition zone is not disclosed or made obvious, inherently or otherwise, by a preheater that melts the surface prior to deposition of the coating. Melting is not precleaning, and a preheater, even one in the form of a gas torch, is not a gas flow or a systematic blast of gas. One of ordinary skill in the art in possession of Borom would not understand Borom to disclose or make obvious a process step of directing a gas flow or systematic blast of gas onto a surface proximate to the deposition zone to preclean the deposition zone. Applicant again respectfully requests that this rejection of claims 43, 46, and 52 be withdrawn.

Hyllberg, Boguslavsky, and Borom do not make obvious claims 42.

The Examiner has rejected claim 42 as being unpatentable over Hyllberg and Boguslavsky as applied to claims 39 and 40, and in further view of Borom. Applicant incorporates herein the relevant portions of the preceding arguments relative to the deficiencies in these references and the lack of motivation in the art to combine them. Applicant respectfully requests that this rejection be withdrawn as claim 42 is allowable as being dependent from allowable claim 39 as well as including the step of directing a gas flow or systematic blast onto a

surface location of the cylindrical target proximate to the deposition zone before entering the plasma stream to preclean the deposition zone, which is not disclosed or made obvious by Borom, as discussed above.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

If the Examiner believes that an Examiner's amendment would put this application in condition for allowance or would like to discuss this submission for any reason, Applicants would welcome the Examiner's input and respectfully request a telephonic interview. The Examiner may contact the undersigned at (612) 492-7305 to schedule such an interview if necessary.

Respectfully submitted,

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